

REMARKS

The applicant respectfully requests reconsideration in view of the amendment and the following remarks. Support for amended claims 1 and 11 can be found in the published specification (US 2006/0247415) in paragraph [0006] of the description.

Claims 1-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Stern et al. US Patent No. 5,763,539 ("Stern") in view of Hsich US Patent No. 5,763,865 ("Hsich") and as evidenced by Taylor et al. Substituted PPV's for Blue Light ("Taylor"). Claims 11-13 and 15-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Stern as evidenced by Taylor. Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over Stern as evidenced by Taylor and further in view of Burroughes et al. US Publication No. 2003/0124341 ("Burroughes"). The applicant respectfully traverses these rejections.

Rejection of Claims 1-9

Claims 1-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Stern in view of Hsich and as evidenced by Taylor. The technical problem underlying the applicant's invention is to find a process for preparing poly(arylenevinylenes) from bis(halomethyl)arylenes wherein the molecular weight of the polymer can be controlled in a reproducible way and whereby polymers are obtained, which are soluble in organic solvents (see paragraph no.[0006] of the published application).

The solution of this technical problem is the use of 0.1 to 80 mol% of a monomer of formula (I) according to claim 1 wherein the monomer comprises substituents R.

As the Examiner stated, Stern teaches a process for preparing poly(arylenevinylenes) from a halomethylsulfinylmethylarylene, but does not teach a process for preparing poly(arylenevinylenes) from a bis(halomethyl)arylene (see the bottom of page 2 to the top of

page 3 of the Final Office Action). Stern discloses that the monomers for the polymerization reaction can be unsubstituted or they can be substituted at the halomethyl group or at the sulfinylmethyl group, such as some of the precursor monomers shown in column 6. However, Stern does not disclose any technical effect associated with monomers, which are substituted at the halomethyl group or at the sulfinylmethyl group, but disclose the substituted monomers and the unsubstituted monomers as being equivalent.

Hsieh teaches the synthesis of poly(arylenevinylenes) from bis(halomethyl)arylenes. However, the polymerization method disclosed by Hsieh does not give reproducible results as described in detail in paragraph [0012] of the present invention¹. The person of ordinary skill in the art learns from Hsieh that poly(arylenevinylenes) are obtainable from bis(halomethyl)arylenes.

The person of ordinary skill in the art furthermore learns from Taylor that polymers of low molecular weight are obtained by using certain monomer units. However, already the precursor polymer having methyl groups on the vinylene bonds is insoluble according to Taylor. There is no information given with respect to the solubility of the resulting conjugated, polymers having substituents on the vinylene bonds. Based on the fact that the solubility of conjugated polymers is in general considerably worse than the solubility of the corresponding non-conjugated precursor polymer, it can be concluded that the resulting conjugated polymers are not sufficiently soluble for gel permeation chromatography. Therefore, Taylor discloses insoluble polymers. These polymers are not solution processable and are therefore not a solution for the technical problem of the present invention. In particular, Taylor does not teach how soluble polymers could be obtained. In contrast, the aim of the experiments of Taylor was the synthesis of insoluble polymers for the production of multilayer devices.

¹ It is noted that the divisional application of Hsieh (US Patent No. 5,817,430) is discussed in paragraph no. 0012 of the published application.

Also the combination of Stern with Hsieh and Taylor would not lead to the present invention as the person skilled in the art knows from Stern and Hsieh only that in principle it might be possible to synthesize poly(arylenevinylene) polymers from bis(halomethyl)arylenes with substituted vinylene bonds, but he also knows from Taylor that polymers wherein the vinylene bonds are substituted are insoluble. The person of ordinary skill in the art would therefore not be tempted to synthesize polymers wherein one part of the vinylene bonds is substituted whereas the rest of the vinylene bonds are unsubstituted when looking for a solution of his technical problem.

In contrast, the polymers obtained according to the process of claim 1 show a good solubility and can be processed from solution as can be seen from Table 1 of the present patent application.

The Examiner recognized that Stern does not teach the applicant's claimed mol% but has stated that it would be obvious to optimize result effective variables such as mol% (see the bottom of page 2 of the Final Office Action). However, the applicant believes that it is not evident from a combination of Stern with Hsieh and Taylor that the use of 0.1 to 80 mol% of monomers according to formula (I) of the present invention results in polymers with a solubility of at least 0.5 % by weight in an organic solvent. This is not just an optimization as asserted by the Examiner. Therefore, claims 1 to 9 are inventive over Stern in view of Hsieh and as evidenced by Taylor. For the above reasons, this rejection should be withdrawn.

Rejection of Claims 11-13 and 15-18

Claims 11-13 and 15-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Stern as evidenced by Taylor. Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over Stern as evidenced by Taylor and further in view of Burroughes.

The applicant respectfully disagrees with the Examiner that Stern explicitly teaches the end units of formula (Ia) and (Ib) (see page 4 first paragraph of the Final Office Action). In Scheme 1 (column 7) Stern discloses the reaction mechanism and the reaction intermediates, but the applicant does not believe that Stern discloses the polymers as claimed in claim 11 of the present invention.

The technical problem underlying the present invention is to find poly(arylenevinylene) polymers, which can be obtained from bis(halomethyl)arylenes and which show good solubility in organic solvents (see paragraph no. 0006 of the published application).

As stated above, the solution of this technical problem is the use of 0.1 to 80 mol% of a monomer of formula (I) according to claim 11 wherein the monomer comprises substituents R.

The same argumentation applies for this claim as for the process claims above. Therefore, claims 11 to 13 and 15-18 are inventive over Stern in view of Hsieh and as evidenced by Taylor or in further view of Burroughes. For the above reasons, these rejections should be withdrawn.

In view of the above amendment, applicant believes the pending application is in condition for allowance. Applicant believes no fee is due with this response. However, if a fee is due, please charge our Deposit Account No. 03-2775, under Order No. 14113-00028-US from which the undersigned is authorized to draw.

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Respectfully submitted,

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